

In the Claims

The three independent product claims claim slightly different embodiments of the irreversible humidity indicator card. Claim 1 describes an indicator card including an absorbent sheet material, which is "dark" colored. Basis for this specific claim language is contained on page 14, line 24 through page 15, line 3 and page 14, lines 5 - 9. (The independent process Claims 13 and 14 claim processes for producing the product, generally of Claim 1.) Claim 12 requires the deliquescent material of the indicator card to be "white in color." Basis for this specific claim language is contained on page 13, line 20 - 21. Claim 13 requires that the deliquescent material of the indicator card "not include a dye material." This concept is implied throughout the application as the deliquescent material is required to be light in color so that when it melts, it does not stain the dark colored absorbent sheet material. In addition, Claim 11, as originally filed in the parent application, required that "the deliquescent material not include a dye material." Language concerning the deliquescent material not containing a dye has been added to the specification at page 13, lines 20 - 21. See also new Claims 14 and 15. Basis for these new independent product claims is present in the application. No new subject matter is introduced by any of the claims of this application. In addition, no amendments to the claims were made based on patentability, but rather the new claims claim inventions never claimed in the parent application.

Discussion

The primary reference cited by the United States Patent and Trademark Office against the claims of the parent Application was Stewart, et. al., U.S. Patent No. 4,793,180 ("Stewart, et. al."). In an Office Action in the parent application dated March 31, 2003, the USPTO rejected substantially all of the claims of the application based on Stewart, et. al. in view of Esch, et. al. U.S. Patent No. 4,205,043 ("Esch, et. al."). While Esch, et. al. was cited, the primary reference was Stewart, et. al. The applicants respectfully assert that upon a detailed analysis of the teachings and disclosures of Stewart, et. al., it is clear that all claims of this divisional application are allowable because of significant distinctions in structure, composition and functionality of the applicants' inventions over the teachings of Stewart, et. al. alone or in combination with Esch, et. al.

The applicants have created an improved irreversible humidity indicator card, which comprises a deliquescent material (40) contained within openings (26) in an intermediate carrier material (20). Upon the melting of the deliquescent material (40) due to exposure to moisture, the deliquescent material (40) is absorbed by a dark colored absorbent sheet (50), which is secured to the back of the intermediate carrier material (20). The preferred color of the deliquescent material (40) is white. Because the color of the

colored absorbent sheet is required to be "dark", preferably red, green or black, upon the melting of the preferably white deliquescent material (40), the dark color of the colored absorbent sheet (50) shows through the openings (26) in the intermediate carrier member (20) and through a clear first outer layer (30), which covers the intermediate carrier member (20) so that the humidity level, as indicated by the dark color of the absorbent sheet, can be easily determined. A person utilizing the irreversible humidity indicator card (10) of the applicants, prior to the melting of the deliquescent material (40), would note an all white or generally all white card. The color of all visible components of this card, including the intermediate carrier material (20) and the deliquescent material (40), will be white or lightly colored. After the deliquescent material (40) melts and is adsorbed by the dark colored absorbent sheet (50), the viewer of the card will note a series of darkly colored sections, preferably in circular shape, as shown in Figure 2. These colored circles, which comprise portions of the dark colored absorbent sheet (50), contrast significantly with the white or generally white color of the remaining portions of the intermediate carrier material (20). This series of colored circles immediately indicates, even to a casual observer, that a particular humidity level has been reached. This new and improved irrevocable humidity indicator card is easy to use and, upon viewing, quickly informs the viewer whether the

designated humidity level has been reached.

Stewart, et. al. also discloses a delayed action, irreversible humidity indicator. The indicator is generally a part of a plug that is secured into an opening in a container. While this indicator does include some, but not all, of the elements that are present in the applicants' invention, it operates in an entirely different manner than does the applicants' invention.

The component of Stewart, et. al. which was previously determined by the USPTO to be equivalent to the applicants' colored absorbent sheet material (50) is the blotter paper (8), as shown in Figures 3A, 3B and 4. The deliquescent material in Stewart, et. al. is preferably an alkali metal salt and is required to be coated with a water soluble dye. (Col. 4, lines 14 -15.) For example, in a preferred embodiment, the deliquescent material is sodium chloride crystals "coated with a brilliant orange dye." (Col. 4, line 18.) This deliquescent agent is further described as a "dye-coated deliquescent agent (20)" at Col. 4, line 22.

In operation, when humidity reaches a predetermined level for a predetermined period of time within the container holding the Stewart, et. al. device, the dyed deliquescent material melts and the dye, which coats the deliquescent agent, is absorbed by the blotter paper (8). The blotter paper is required to be "white or a light color," (Col. 4, line 23.) to contrast with the color of the dye. To show the color of the dye, the blotter paper (8), which is

"white or a light color", is "stained by the water soluble dye." The effect of the adsorption of the dye is that the "white or a light color" blotter paper (8) changes color from white or a light color to the color of the "soluble dye" that coats the "dye-coated deliquescent agent (20)" (col. 4, line 22) "thereby allow[ing] an observer to more easily perceive the condition of the indicator." (Col. 4, lines 25 - 27.)

Thus, the components of the Stewart, et. al. product operate exactly opposite to the components of the device as claimed in the application. In the device of the application, the dark color of the colored absorbent sheet (50) shows through once the generally white deliquescent material (40) melts and is absorbed by that dark colored absorbent sheet (50). This deliquescent material is preferably white and contains no dye. In contrast, in Stewart, et. al. the dye from the deliquescent material (20) stains the blotter paper (8) upon the melting of the deliquescent material and is the component which discloses that the designated humidity level has been reached.

When the two products are viewed by a person skilled in the art, that person may see a similar result. However, the composition, structure and functionality of the applicants' invention works opposite to that of the device of Stewart, et. al.

The major distinctions are at least as follows:

1. The blotter paper (8) of Stewart, et. al. is required to

be "white or a light color." This is necessary "to increase the contrast between the color of central region (10) before and after being stained by the water soluble dye..." (col. 4, lines 23 - 26). In contrast, the absorbent sheet material (50) of the applicants' device is required to be "a dark color, such as red, green or black so that its color shows through when its deliquescent material (40) melts and is absorbed by the colored absorbent sheet (50) and the intermediate carrier member (20)." Page 14, line 25 through page 15, line 3.

2. The deliquescent material of Stewart, et. al. is required to be coated with a dye, preferably a brilliant color, such as orange. (Col. 4, line 18.) If the deliquescent material of Stewart, et. al. is not dyed such a brilliant color, the device of Stewart, et. al. would not function to show "the contrast between the color of the central region (10) before and after being stained by the water soluble dye and thereby allowing an observer to more easily perceive the conditions of the indicator." (Col. 4, lines 24 - 27.) No dye is present on the deliquescent material of the applicants' device.

Stewart, et. al. makes it absolutely clear how their device functions, not only in the specification but in the summary of the invention and in what they claim. In the summary of invention, the device is described as having "a deliquescent agent coated with a water soluble dye, and further including a layer of absorbent

material... for absorbing the water soluble dye..." (col. 2, lines 55 - 59). This concept of a deliquescent agent coated with a water soluble dye and a layer of absorbent sheet material, which absorbs the dye coated deliquescent agent after the deliquescent agent has melted is also specifically claimed in Claim 1, col. 6, lines 18 - 25; and Claim 8, col. 7, lines 6 - 11. See also the abstract, lines 5 - 8.

Esch, et. al. also fail to disclose any of the components of the applicants' invention that are discussed above.

The applicants respectfully assert that the disclosure of Stewart, et. al. does not teach by itself or in combination with Esch, et. al. or any other reference previously cited, the precise composition of the invention, as now claimed. In fact, because of the entirely different structure used by Stewart, et. al. to produce the contrast in colors, the components of the Stewart, et. al. irreversible humidity indicator element "teach away" from the disclosure of the invention. Any combination of Stewart, et. al. with Esch, et. al. or any other reference can not teach the invention, as now claimed, because of this "teaching away" disclosure of Stewart, et. al.